A CIRM Disease Team for the Repair of Traumatically Injured and Arthritic Cartilage

Grant Award Details

A CIRM Disease Team for the Repair of Traumatically Injured and Arthritic Cartilage

Grant Type: Disease Team Planning

Grant Number: DT1-00656

Investigator:

Name:	Jeffrey Lotz
Institution:	University of California, San Francisco
Type:	PI

Award Value: $33,172

Status: Closed

Grant Application Details

Application Title: A CIRM Disease Team for the Repair of Traumatically Injured and Arthritic Cartilage

Public Abstract:

Arthritis is a disabling condition that afflicts 6 million Californians, costing our state nearly $32 billion annually for health care and lost wages. Given the growth of an aging population encouraged to maintain an active lifestyle due to the overall health benefits, the impact of arthritis is expected to increase significantly. For example, the Center for Disease Control projects that 60 million people nationwide will have arthritis by 2020.
The goal of this Disease Team Proposal is to plan an accelerated translation of stem cell therapies for cartilage repair that will provide an early intervention to prevent and treat arthritis.

The proposed cartilage regeneration program builds upon the institutional applicant's world-recognized leadership in stem cell and skeletal biology, and the clinical expertise of the orthopaedic surgery. In addition, strong partnerships with California industry will facilitate successful implementation of clinically beneficial strategies. The team leader is the director of both an industry-collaborative center and an orthopaedic biomechanics laboratory, and a pioneer of new protocols that direct stem cells to make cartilage.

Our multidisciplinary team members at {REDACTED} research institutions have well-established interactions that serve as the foundation of our program to propel translation of stem cell therapy. The majority of team members are affiliated with a center focused on cartilage repair and regeneration which fosters such collaborations. In fact, we are already executing pre-clinical studies to assess the potential of stem cells to repair cartilage, and human clinical trials using a patient's own cartilage cells to treat cartilage erosions. In addition to advancing novel treatments, our team includes international leaders in the development of novel imaging technologies to track implanted stem cells and cartilage repair. These non-invasive imaging techniques will be critical for assessing early success in large animal studies and human clinical trials.

Successful completion of this Disease Team Award will result in the development of a non-invasive imaging technology for early detection and localization of cartilage erosions, and a minimally invasive stem cell-based treatment that can be used to heal cartilage and prevent arthritis progression. Such a treatment option does not currently exist.

This CIRM Disease Team Planning Grant will assemble experts in all areas necessary for realizing clinical translation, and define milestones to coordinate, motivate, and accelerate development of a stem cell-based therapy for cartilage regeneration.

Statement of Benefit to California:	Approximately 6 million adults in California, or 27% of the population have some form of arthritis. This disease costs California nearly $32 billion each year, with an estimated $23.2 billion spent on direct medical care and $8.3 billion due to lost wages. The centers for Disease Control and Prevention projects that 60 million people nationwide will have arthritis by 2020. Consequently, successful development of improved arthritis therapies will benefit a significant portion of the California population. Additionally, we anticipate that the management structure of this program along with the cell/matrix technologies can ultimately be applied to a host of other musculoskeletal diseases such as back pain, osteoporosis, and fracture repair. In addition to the health of Californians, cell based therapies for arthritis and other musculoskeletal conditions provide a huge commercial opportunity for California industry. Credit Suisse has estimated that the growth potential for the orthopaedic industry focused on hip and knee treatment is positive, with projected global sales expanding from $9.6 billion in 2006 to $13 billion in 2011. The orthobiologic market that includes regenerative technologies currently accounts for roughly 12% of the worldwide orthopaedic implant market and is the fastest growing segment, at 20% annually. Our Planning Team will represent of a variety of California companies who will directly benefit from this effort. Clearly their economic success will provide employment opportunities for Californians, tax revenue for the state, and help maintain {REDACTED} as a world leader in biotechnology research and development. This work also aids the research enterprise of California universities by augmenting our competitiveness for NIH funding. This, in turn, brings the brightest scientific talent to the State, fuels innovation, and ensures continued California leadership in the biotech industry. Given the significant unmet clinical need, market opportunity, and rapidly evolving technologies, we anticipate that stem-cell based therapies for arthritis will be realized in the next 4 to 8 years. The CIRM Disease Team Initiative can assure this occurs in California.

Source URL: https://www.cirm.ca.gov/our-progress/awards/cirm-disease-team-repair-traumatically-injured-and-arthritic-cartilage